XSLAN
SHDSL Switch

User's guide

Document reference : 9014709-01

The XSLAN SHDSL switch is manufactured by

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Appendix 1 : Distance versus data rate and cable quality

1 Products identification

XSLAN SHDSL switch	140	1400	1220	1230	2400	2220	2230
SHDSL ports	1	1	1	1	2	2	2
Maximum data rate (Mb/s)	2.3	2.3	2.3	2.3	4.6	4.6	4.6
10-100 Mb/s Ethernet ports	4	4	2	2	4	2	2
RS232	0	0	1	2	0	1	2
RS485	0	0	1	0	0	1	0
Router	No	Yes	Yes	Yes	Yes	Yes	Yes
Quality of service	No	Yes	Yes	Yes	Yes	Yes	Yes
Gateway (raw, telnet, modbus, unitelway)	0	0	2	2	0	2	2
RJ45 cable *	1	1	1	1	1	1	1
Line cable *	1	1	1	1	2	2	2

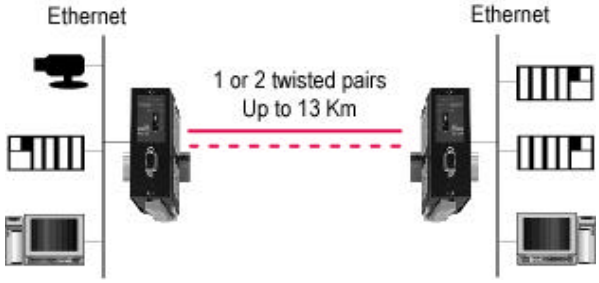
*** delivered with the product**

2 Product overview

2.1 Function

The XSLAN shdsl switch enables to extend an Ethernet network over kilometres using one or two simple voice-grade twisted pairs (telephone lines).

Point to point
1 pair (up to 2.3 Mb/s)
2 pairs (up to 4.6 Mb/s)



2.2 Shdsl operations

The XSLAN comes with 1 or 2 SHDSL interfaces which allow to extend an ethernet network at up to 2.3 Mb/s with 1 pair or 4.6 Mb/s with 2 pairs.

2.2.1 Data rate

Each SHDSL interface features an adaptive data rate from 128 Kb/s up to 2.3 Mb/s.

The data rate is a function of the cable quality and the distance with the next SHDSL switch. For instance, the maximum distance between 2 switches through a line is 13 Km (8 miles) with a 0.9 mm wire diameter cable.

2.2.2 Distance between switches

The table in appendix 1 gives the data rate which can be expected over a line versus the length of the line (distance between 2 switches).

2.3 Ethernet ports

The XSLAN provides 2 or 4 ethernet RJ45 interfaces (depending on the product reference).

2.4 Quality of service

The product (except XSLAN-140) provides “DiffServ” quality of service functionality to give transmission priority to critical applications.

Devices TCP ports and IP addresses are classified in 5 priority classes. A minimum and a maximum bandwidth is allocated to each class.

2.5 Asynchronous gateway

The XSLAN (-1220, -1230, - 2220 or 2230) include a versatile 2 ports asynchronous gateway.
It offers raw client and server, modbus client and server, telnet and multicast protocols.

2.6 Diagnostic functions

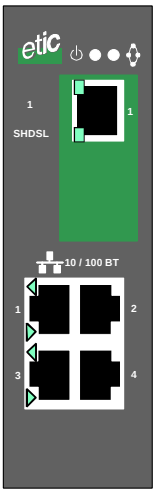
The XSLAN html server provides diagnostic pages giving the guarantee the transmission quality is what it has to be.

2.7 Html or DIP swithes configuration

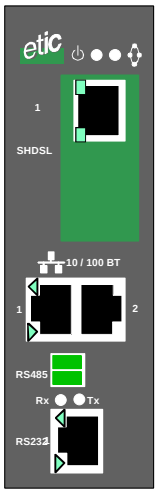
The XSLAN can be configured either with an html browser if advanced functions are necessary (QoS, RS gateway, diagnostic …).
It can be configured with a few DIP switches for simple unmanaged applications.

Data sheet	
Dimensions	137 x 48 x 116 mm (h, l, d)
C.E.M	EN50082-2
Electrical safety	EN 60950
Thunder	EN61000-4 et -5
Supply voltage	9 to 30 VDC
Consumption	4W
Operating T°	-20°/ + 60°C non condensing
SHDSL	ITU-T G.991.2, 802.3ah : 2BaseTL (EFM) Data rate : 128 kb/s to 2.3 Mb/s with 2 wires
Ethernet	XSLAN-140 or –1400 or -2400 : 4 ports XSLAN-1220 or –1230 or -2220 or –2230 : 2 ports 10/100 Mb/s Half/Full duplex Auto MDI/MDIX
Switch	Store and forward - 1024 MAC @
Router	Static routes RIP V2
QoS	DiffServ compliant with RFC 2474, 2475, 2597, 2598 4 priority levels (premium, gold, silver, bronze)
SNMP	SNMP V2 – MIBII and traps
RS232-RS485	XSLAN-1220 or 2220 : 1 RS232 and 1 RS485 XSLAN –1230 or -2230 : 2 RS232 ports 1200 to 115200 kb/s parity E/O/N Raw client and server Modbus client and server unitelway Telnet
Logs	300 events (date & time)
Configuration	Managed mode : HTML browser Unmanaged mode : Dip switches

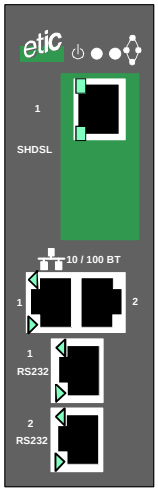
1 Product description



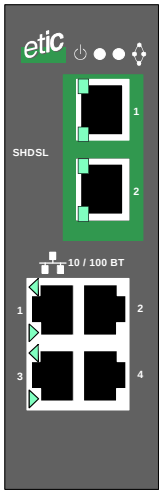
XSLAN-140
XSLAN-1400



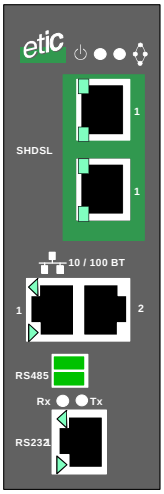
XSLAN-1220



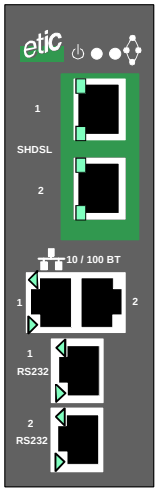
XSLAN-1230



XSLAN-2400

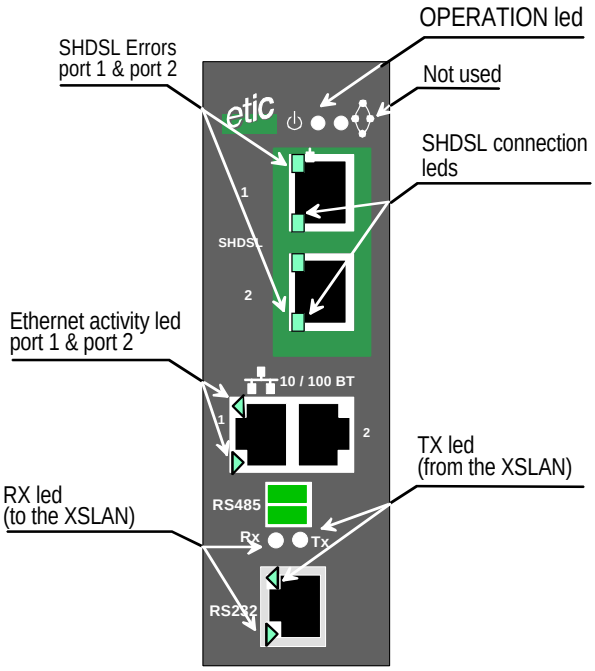


XSLAN-2220



XSLAN-2230

1.1 Leds



Function	Led	Description
Ethernet	**LINK/DATA**	Ethernet activity
RS232	**Rx**	Bytes received from the RS232 (to XSLAN)
	Tx	Bytes transmitted to the RS232 (from XSLAN)
RS485	**Rx**	Bytes received from the RS485 (to XSLAN)
	Tx	Bytes transmitted to the RS485 (from XSLAN)
Shdsl led (Lower)	**Line**	Slowly blinking : Shdsl connection in process Lighted : Shdsl connection set Quickly blinking : Traffic over the SHDSL link
Shdsl led (Upper)	**Error**	Off : Error-free transmission Quickly blinking : Transmission errors
Operation	⏻	Green : Ready for use Red : Alarm

1.2 Connectors

8 pins screw block Supply voltage and input / output		
Pin Nr	**Signal**	**Function**
1	Power 1 +	Supply voltage input 1 : 9 to 30 Vdc
2	Power 1 -	0 V
3	Power 2 +	Supply voltage input 2 : 9 to 30 Vdc
4	Power 2 -	0 V
5	3V3	+ 3.3 VDC voltage provided by the product
6	In	Input
7	F +	Output + (max 50Vdc - 0,6A)
8	F -	Output -

SHDSL RJ45 connector		
Pin Nr	**Signal**	**Function**
1	N.C.	-
2	N.C.	-
3	N.C.	-
4	TIP	SHDSL line
5	RING	SHDSL line
6	N.C.	-
7	N.C.	-
8	N.C.	-

Ethernet RJ45 connector		
Pin Nr	**Signal**	**Function**
1	Tx +	TX polarity +
2	Tx -	TX polarity -
3	Rx +	Reception polarity +
4	N.C	-
5	N.C	-
6	Rx -	Reception polarity -
7	N.C.	-
8	N.C.	-

RS485 2 pins screw block		
Pin Nr	**Signal**	**Function**
1	A	RS485 polarity A
2	B	RS485 polarity B

RS232 RJ45 connector (To connect to a DCE)			
Pin Nr	**Circuit**		**Function**
1	DTR - 108	Out	Data terminal ready
2	TD - 103	Out	Data Emission
3	RD - 104	IN	Data Reception
4	DSR - 107	IN	Data set ready
5	SG - 102	-	Ground
6	Not used	Out	-
7	CTS - 106	IN	Clear to send
8	RTS - 105	Out	Request to send

1.3 DIP switches

DIP switches			
SW 1	**SW 2**	**Management**	
OFF	OFF	The current IP@ of the product is the stored IP @	
ON	OFF	**The active IP@ of the product is the factory IP@ : 192.168.0.128 No login and password are required to access to the html server**	
OFF	ON	The active IP@ is provided by the BOOTP or DHCP server.	
ON	ON	Reserved	
SW 3	**SW 4**	**SW 5**	**Shdsl port 1**
OFF	OFF	OFF	NTU mode
OFF	OFF	ON	LTU mode - Auto
OFF	ON	OFF	LTU mode – 2304 kbit/s
OFF	ON	ON	LTU Mode – 2048 kbit/s
ON	OFF	OFF	LTU Mode – 1536 kbit/s
ON	OFF	ON	LTU Mode – 1024 kbit/s
ON	ON	OFF	LTU Mode – 512 kbit/s
ON	ON	ON	LTU Mode – 256 kbit/s
SW 6	**SW 7**	**Topology**	
ON	ON	Point to point with 4.6 Mb/s inverse-multiplexing (2 lines = 4 wires)	
SW 8 to SW 12		Not used - Must be left OFF	

2 Ventilation

To avoid overheating when the ambient temperature is high, leave a 1 cm (0.5 inch) space on each side of the product.

3 Supply voltage

The product comes with 2 separate voltage inputs, so that 2 external power supply modules can be connected to the product. If one power supply module fails, the XSLAN will be powered by the other.

The supply voltage must be strictly lower than 30 VDC and higher than 9 VDC. The consumption is 170 mA at 24 VDC.

4 Fuse

The product is protected with a 3A fuse located on the electronic board near the supply voltage connectors.

!!! A replacement fuse is available on the board ; it is located over the leds.

5 Ethernet ports

The XSLAN features two or four auto-sensing 10/100 Mbps MDI/MDI-X LAN ports.

6 RS232 (XSLAN--1220 -1230-2220 -2230)

The RS232 data rate can be tuned from 1200 to 115200 b/s with parity (even / odd) or no parity.

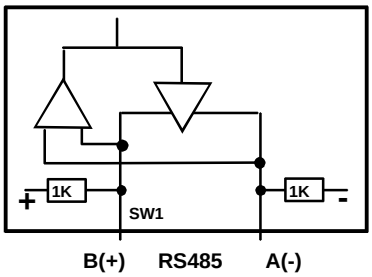
The data terminal must be less than 10 meters far from the modem.

Cables can be provided to connect the product to DTE and DCE as follows :

RS232 cables (L=1m)		
Code	**User connector**	**Cable function**
CAB592	SubD 9 male	To connect a DCE to the XSLAN
CAB593	SubD 9 female	To connect a DTE to the XSLAN
CAB609	wires	To connect a device providing a specific connector

7 RS485 (XSLAN-2230 -2230)

The RS485 serial interface is provided on the front panel 2 pins screw-block.



Polarisation resistors
1 Kohm bus polarisation resistors are included inside the product.

RS485 line adaptation
For a several meters long connection over the RS485 local interface, it is not necessary to adapt the RS485 line. For a longer distance, connect a 120 Ohm resistor at each end of the line.

8 SHDSL

The XSLAN-140 –1400 –1220 -1230 is delivered with 1 line cable (CAB614).
The XSLAN-2400 –2220 -2230 is delivered with 2 line cables (CAB614).

That cable ends with 2 wires.
The 2 wires have to be connected to the 2 wires of the line.
The wires can be inverted.

Shield :
If the cable is shielded, the shield must be connected, at one end, to the protective earth pin available at the bottom of the product or directly to the earth.

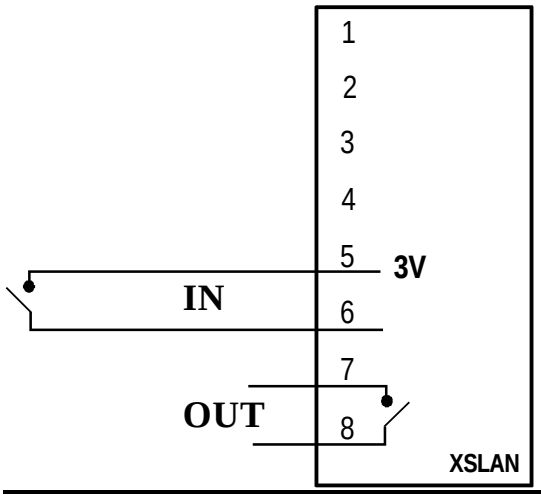
9 Input and output

Alarm output
1 relay output is provided to indicate an alarm.
The alarm condition can be selected using the html server.
The Default condition is :

The XSLAN is out of power or 1 or both SHDSL ports are not connected.

The electrical characteristics of the output are :
Maximum voltage : 50 VDC
Maximum current : 500 mA

Input
That input is not isolated.
if it is opened, an SNMP trap will be sent to the SNMP server is that function has been enabled.



1 Overview

The XSLAN can be configured either with DIP switches or with an html browser through Ethernet.

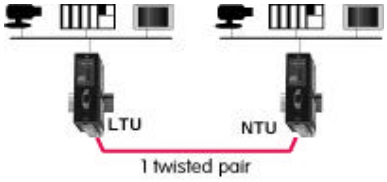
The Html offers very useful diagnostic functions like Error rate statistics, ping, logs and so on. It is advised to use the html server when the network is complicated or when distances between switches are long.

Moreover, advanced functions like Quality of Service or the asynchronous gateway can only be configured with the html server. To select DIP switches configuration, set SW1 et SW2 ON.

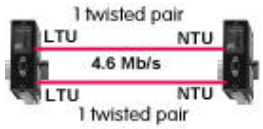
1.1 SHDSL interfaces configuration (SW3, SW4, SW5)

When 2 XSLAN switches are connected to one another through a line, one has to be configured as an LTU (calling party) and the other one as an “NTU”. (called party).

The switch which is named “LTU” negotiates **and forces** the data rate over the line; the NTU can only accept.
The data rate can be either negotiated by the LTU itself (auto mode) , or imposed by the user with the DIP switches.

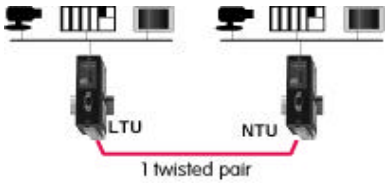


Inverse-multiplexing case
If port 1 has been configured as an NTU (SW3=OFF, SW4=OFF, SW5=OFF), port 2 is forced as an NTU

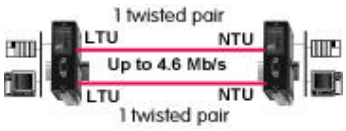


1.2 Inverse-multiplexing

?? **Point to point**
Set the SW6 and SW7 OFF.



?? **Inverse-multiplexing**
The data rate will be twice what it would be with only 1 pair (2 wires).
Moreover, in case of a break of 1 line, the other line will backup the transmission.
Set SW6 ON and SW7 ON



2 Connecting a PC to the XSLAN for configuration

If the product is coming from factory, we advise to configure the XSLAN by connecting directly the PC to one of the RJ45 ports (see paragraph 3.1).

2.1 Configuring with a PC connected to the XSLAN Ethernet interface

Step 1 : Check the DIP switches SW1 and SW2; they must be set to OFF and OFF to select the stored IP address, or, if necessary, to ON and OFF to restore the factory IP address.

Coming from factory, the DIP switches SW1 and SW2 are set OFF (ready for configuration); and the IP address of the XSLAN is 192.168.0.128.

Step 2 : Create or modify the PC TCP/IP connection
Assign to the PC an IP @ in accordance with the XSLAN IP address.
For the first configuration, assign or instance 192.168.0.127 to the PC.

Step 3 : Connect the PC directly to an XSLAN ethernet interface
using any Ethernet cable (straight or crosswired)

crosswired)

Step 4 : Launch the navigator
Enter the IP @ of the XSLAN.

The Home page of the administration server is displayed

Note :
If the home page cannot be displayed, refer to paragraph 4 below.

2.2 Configuration through the LAN

Case of a LAN with a BOOTP or DHCP server

Step 1 : Set the DIP switches SW1 OFF and SW2 OFF to select DHCP / BOOTP operation.

Step 2 : Launch ETIC FINDER to detect the XSLAN over the LAN.
Click the product once detected.

The Home page of the administration server is displayed.

Note :
If the home page cannot be displayed, refer to paragraph 4 below.

Case of a LAN without BOOTP or DHCP server
That method must be avoided for the first configuration, because the factory IP address of the XSLAN can also have been assigned to another product.

Otherwise, launch the html browser and enter the IP address assigned to the XSLAN.

Or, launch the ETICFINDER utility.

3 Wrong IP address or password

When launching the html browser, the homepage of the html server may not be displayed; the cause may be the IP address you enter or the password you use are wrong.

if the XSLAN IP address you enter is wrong, you can recover the factory IP address by setting SW01 ON and SW2 OFF.
The factory IP address 192.168.0.128 will be restored as long as the SW01 micro-switch will be left ON. Once, SW01 will be set OFF, the stored IP address (the IP address which is displayed) will be used by the product.

Wrong Login to the administration server
The access to the administration server can be protected by a login and password; If the Login & or password entered to access to the administration server have been rejected, it is possible to recover a **free access**, by setting SW01 ON and SW2 OFF.

Careful : The factory IP address 192.168.0.128 will also automatically be assigned to the product as long as SW01 will remain ON and SW2 OFF.

4 Configuring the SHDSL XSLAN switch

4.1 Saving configuration modifications

?? **After every modification, click the « Save » button at the bottom of the screen.**

?? **After some parameters changes, the XSLAN must restart.**
When the configuration has been completely carried out, click the « reboot » red button in the green bar, if it is displayed.

4.2 Administration server overview

System

Administration	To protect access to the administration server.
Target	To define the machines connected to the LAN (for QoS only)
Service list	To define the port (TCP or others) used between the machines
Date & time	To set date and time of the day
Syslog	Export the log to a PC
Firmware update	Update the product fimware
Save / restore	To download / upload the configuration file of the product.
Reboot	To restart the product

Ethernet & switching

SHDSL port	To set the data rate over shdsl
Ethernet port	Tune the Ethernet ports

IP protocol & routes

Ip protocol	To enter the IP @ of the unit
RIP	To enable the RIP protocol
Static routes	To enable IP routing and set the routes

Quality of service

Activate	To enable the function
Traffic classification	to assign a priority class to each TCP port and IP source @
Classes	Set the minimum bandwidth allocated to each class

Alarms	To set the alarms
SNMP	To define traps and SNMP server
IO	To defines the conditions the output will open

Email	Enter the alarm email parameters

IP to RS gateway (XSLAN-2220 & 2230 only)

Modbus	To configure the modbus gateway.
Transparent	To configure the raw, multicast & telnet gateway
Unitelway	To configure the unitelway gateway

Diagnostics

Logs	To display logs
Network status	To display all the parameters of the connection in use MAC & IP @, SHDSL connection : data rate, error rate, statistics
Gateway status	To display the status of the gateway
Micro switch	To display the micro switches current position
Ping	To ping a machine
Table of routes	To display the table of routes
Ping	To ping a machine
IO control	To display the status of the IOs.

About	To display the firmware and hardware identification

4.3 System configuration menu

4.3.1 Administration rights menu

The « administration rights » menu allows to restrict access to the administration server from the LAN,

Attention : If you don't remember this login & or password, you can restore a free access to the html server and, at the same time the factory IP address by setting SW01 ON and SW2 OFF.

4.3.2 Target list menu

This menu allows to define the IP addresses of the machines belonging to the network.
That list has to be entered if you wish to use the Quality of Service function.

4.3.3 Save / restore menu

That menu allows to store the configuration file in a PC hard disk or to download a stored file to the XSLAN.

4.3.4 Reboot Menu

To restart the unit.

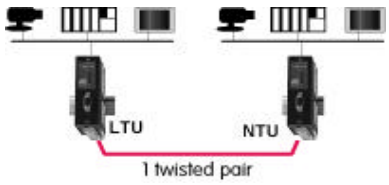
4.4 Ethernet & switching menu

4.4.1 SHDSL port

Mode parameter

When 2 XSLAN switches are connected to one another through a line, one has to be configured as an LTU (master party) and the other as an "NTU". (slave party).

The switch which is named "LTU" negotiates **and forces** the data rate over the line; the NTU can only accept.



“Data rate” parameter
If the value “auto” is selected, the data rate will be negotiated by the LTU itself; the connection delay is much longer, because the XSLAN as to try all the data rates and select the best one.

If a value from 128 Kb/s to 2.3 Mb/s is selected, the XSLAN will try to connect at that data rate.

To select the right data rate,

- refer to appendix 1 to estimate the data rate which is possible to get according to the distance.
- Select that data rate and save.
- Reboot the product.
- Test the connexion quality.
  The lower led of the RJ45 SHDSL connector blinks and is then lighted. The “Diagnostic” and then “networks status” page displays the connection process and gives an index (1 to 5) of the transmission quality; the transmission quality has to be better than 3; otherwise, decrease the data rate.
- Press the “Show statistics button to check the transmission is error free and the signal to noise ratio is OK

“Signal power” parameter
The power of the signal emitted towards the line is normally 14.5 dBm.
It must not be reduced except for very short distance transmission and if errors appear.

“SHDSL port aggregation” parameter (XSLAN-2400 –2220 –2230)
If 2 pairs are used (each connected to an SHDSL port), and if the aggregation option is selected, the data rate will be twice what it would be with only 1 pair (2 wires).
Moreover, in case of a break of 1 line, the other line will backup the transmission.

4.4.2 Ethernet port

Each port will be usually set in the “auto” mode; however, if necessary, 10 Mb/s or 100 Mb/s and full or half duplex operations can be selected.

4.5 IP Protocol & routing menu

4.5.1 IP Protocol menu

Ethernet network
Enter the IP address, netmask and, if there is one, the default gateway address.

Routing (except XSLAN-140)
It can be useful to enable the routing functions to avoid unnecessary traffic over the shdsl link when the traffic is heavy on each Ethernet network.
In that case, an IP address has to be assigned to the SHDSL interface (see below) and routes have to be entered (see below shdsl network and also RIP and static routes).

SHDSL network (except XSLAN-140)
An IP address has to be assigned to the shdsl interface only it the router function of the XSLAN has been enabled.

4.5.2 RIP(except XSLAN-140)

RIP is a protocol by which several routers exchanges their routes tables so as to facilitate the routing process of each of the routers.

4.5.3 Static routes (except XSLAN-140)

A static route defines a target network (IP address + netmask) and the IP address of the router leading to that network.

4.6 Quality of service (QoS) menu (except XSLAN-140)

4.6.1 DiffServ benefits & overview

The goal of Quality of Service algorithms is to guarantee that critical data flows will be transmitted with lower delay than others.

The XSLAN implements the DiffServ algorithm.

We call “traffic” an IP address and a port Nr.

Four traffic classes are featured :
Premium, Gold, Silver, Bronze, Default (or Best effort).

A minimum and a maximum bandwidth have to be assigned to each class except to the Premium class, the bandwidth of which is not limited.
This operation is carried-out with the “classes” menu.

Each traffic (i.e. a port Nr and IP address) entering the shdsl network has to be assigned to one class; All traffics not assigned to any of the classes are supposed to belong to the default class.
This operation is carried-out with the “classification menu”.

Thus, when a traffic enters the XSLAN switch, it is analysed by the switch and **marked** as premium or gold or silver or bronze or default and then transported through the shdsl network with the relevant priority.

4.6.2 “Classes” menu

Set a minimum and a maximum bandwidth to each class.

4.6.3 “Traffic classification” menu

Assign each traffic (Port Nr + IP source @) to one class.

Take care to assign the Premium class to only a few machines and ports.

4.6.4 Activation

Activate the **QoS** function.

If the traffic is marked outside the SHDSL domain, select the “domain extension” option.

4.7 IP<>RS gateway menu

That menu allows to configure the IP to asynchronous RS232-RS485 gateway included in the XSLAN.

4.7.1 Modbus menu

The ETIC modbus gateway is made to link modbus devices connected to its serial interface to TCP modbus devices connected to the ethernet TCP/IP network.

4.7.1.1 Definitions

A **TCP Modbus client device** is a device connected to the ethernet TCP/IP network and able to send a modbus request to a modbus TCP server which is in charge of answering; A TCP modbus client is equivalent to a master.

A TCP Modbus server device is a device connected to the ethernet TCP/IP network and able to answer to a modbus request received from a TCP modbus client device. A TCP modbus server is equivalent to a slave.

A TCP modbus server can answer to any client of the Ethernet TCP/IP network.

4.7.1.2 ETIC modbus gateway capabilities

The ETIC modbus gateway can be configured

either

to link serial slaves to several TCP modbus clients devices connected to the ethernet network; in that case, select the modbus client gateway,

or

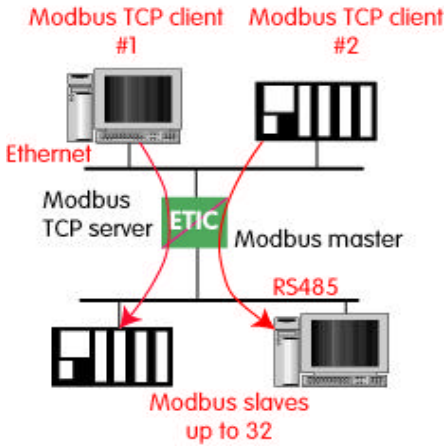
to connect a serial master to several TCP modbus servers devices connected to the ethernet network; in that case, select the modbus server gateway.

4.7.1.3 Modbus server gateway

Modbus slaves devices are connected to the serial interface.

That gateway links asynchronous modbus slaves to modbus TCP clients connected to the ethernet network.

Each TCP client (i.e. modbus master) can send requests to any modbus slave device of the serial interface.



To configure the Modbus server gateway,

?? select the modbus menu and then modbus server,

?? enable the modbus server gateway and set the parameters as follows:

"Modbus protocol" parameter
Select the RTU or ASCII option

"Activate Proxi cache" parameter
Enable the proxi option if you wish to avoid to frequent requests on the serial interface.

"Cache refreshment period" parameter

the same request is received twice or more inside that delay, it will be sent only once to the slave on the serial interface.

“Timeout waiting for the answer” parameter
Set up the timeout the gateway has to wait for the answer of the modbus slave.

“Local retry” parameter
Set up the number of times the gateway will repeat a request to one of the modbus slaves on the serial interface before declaring a failure.

“Inter-character gap” parameter
Set up the maximum delay the gateway will have to wait between a received character of a modbus answer frame on the serial interface and the following character of the same frame.

“Modbus slave address* parameter

If only one modbus slave device is connected to the serial interface, set the modbus address of the device; any TCP modbus request received by the gateway will be sent on the serial interface using that modbus address.

If several modbus slave devices are connected to the serial interface, select “specified by modbus TCP client”;
In that case, each request sent by the TCP/IP modbus client to one of the slaves connected to the serial interface must specify the modbus slave address value in the modbus address field.

“TCP inactivity Timeout” parameter
Set the time the gateway will wait before disconnecting the TCP link if no characters are received.

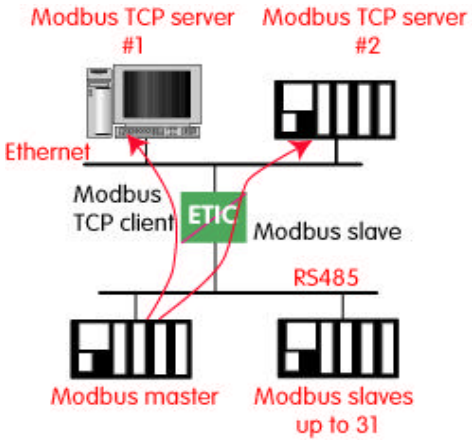
“TCP port number” parameter
Set the port number the gateway has to use.

4.7.1.4 “Modbus client” gateway

A Modbus master device is connected to the serial interface of the XSLAN.

That modbus master can send requests to slaves connected to the serial interface or to 256 modbus TCP servers maximum connected to the IP

network (i.e. modbus slaves).



To configure the modbus client gateway,

?? select the modbus menu and then “modbus client” menu;
?? enable the “modbus client” gateway and set up the parameters as follows :

“ASCII / RTU protocol” parameter
Select the right option

“Inter-character gap” parameter
Set up the maximum delay the gateway will have to wait between a received character of a modbus answer frame and the following character of the same frame.

“TCP inactivity Timeout” parameter
Set the time the gateway will wait before disconnecting the TCP link if no characters are detected.

“TCP port number” parameter
Set the TCP port number the gateway has to use.

“IP address table”
When the serial master sends a modbus request to a slave, it includes the modbus address of that slave.

If that slave is not a serial slave but a TCP modbus server on the ethernet network, the ETIC gateway needs to know what is its IP address.
That IP address table allows to assign an IP address to each modbus slave address.

?? To assign an IP address to each modbus slave device with which the serial master device needs to communicate, click the “add a link” button; Assign an IP address in front of each modbus slave address with which the serial master device will have to communicate.

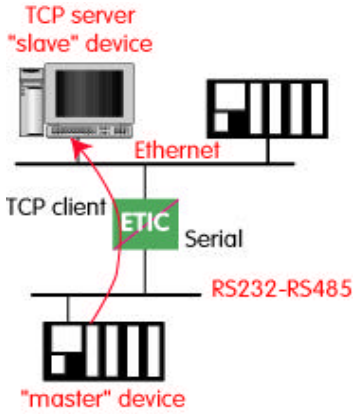
4.7.2 "Transparent" menu

The gateway provides solutions to connect serial devices to the IP network without interpreting the application protocol. That solutions are called transparent gateways.

4 transparent gateways are available : The raw client or server gateway, the multicast gateway or the telnet gateway.

4.7.2.1 "Raw client" gateway

That gateway can be used if a serial master device has to send requests to one slave device (also called server) located on the IP network.



The serial device must be for example a master device in half duplex protocols.

To configure the “raw client” gateway,

?? Select the “transparent” and then the “raw client” menus.

?? Enable the raw client gateway; and set up the parameters as follows :

“RS232/485 input buffer size” parameter
Set up the maximum length of an asynchronous string the gateway will store before transmitting it to the IP network.

“Timeout of RS232/485 end of frame” parameter
Set up the delay the gateway will wait before declaring complete a string received from the asynchronous device.
Once declared complete, the gateway will transmit the string to the IP network.

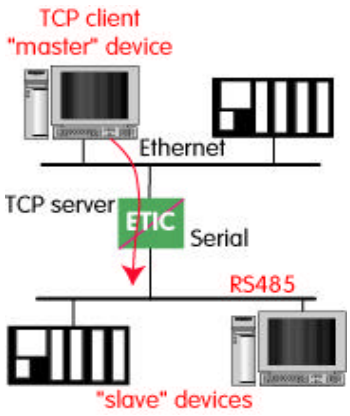
“TCP inactivity Timeout” parameter
Set the time the gateway will wait before disconnecting the TCP link once characters are no longer detected.

“TCP port number” parameter
Set the port number the gateway has to use.

“Raw server IP address” parameter
The raw client gateway is able to communicate with a raw server gateway. Assign an IP address to define the destination gateway.

4.7.2.2 "Raw server" gateway

That gateway can be used if a serial slave device has to answer requests coming from devices located on the IP network and acting like a master (also called TCP client).



To configure the “raw server” gateway,

?? Select the “transparent” and then the “raw server” menus.

?? Enable the raw server gateway and set up the parameters as follows :

“RS232/485 input buffer size” parameter
Set up the maximum length of an asynchronous string the gateway will store before transmitting it to the IP network.

“Timeout of RS232/485 end of frame” parameter
Set up the delay the gateway will wait before declaring complete a string received from the asynchronous device.
Once declared complete, the gateway will transmit the string to the IP network.

“TCP inactivity Timeout” parameter
Set up the time the gateway will wait before disconnecting the TCP link if no characters are detected.

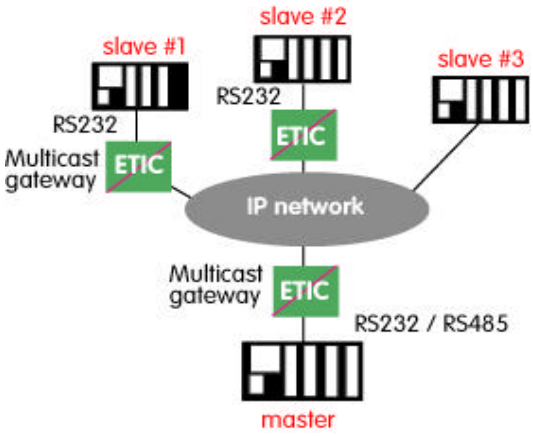
“TCP port number” parameter
Set up the port number the gateway has to use.

4.7.2.3 “Multicast” menu

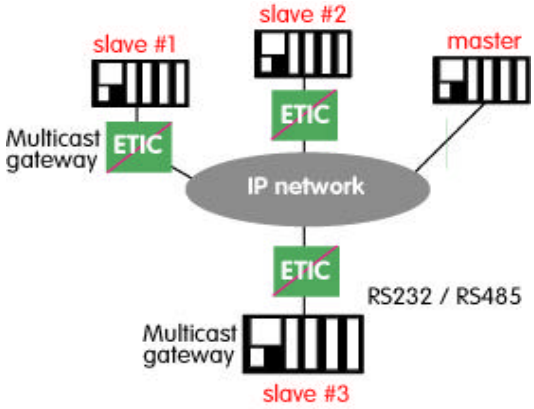
Internet Protocol multicast is a bandwidth-conserving technology that reduces traffic by simultaneously delivering a single stream of information to thousands of corporate recipients.

Thus, the multicast gateway must be used when

?? a serial master device has to send requests to multiple slave devices; that devices can be IP or serial devices.



?? Or when an IP master device (client) has to send requests to multiple slave devices; that devices can be IP or serial devices.



The *Internet Assigned Numbers Authority (IANA)* controls the assignment of IP multicast addresses.

The range of addresses from 224.0.1.0 through 238.255.255.255 are called “globally scoped addresses”. They can be used to multicast data between organizations and across the Internet.
The range of addresses from 239.0.0.0 through 239.255.255.255 contains limited scope addresses or administratively scoped addresses. These are defined by RFC 2365 to be constrained to a local group or organization. Routers are typically configured with filters to prevent multicast traffic in this address range from flowing outside an autonomous system (AS) or any user-defined domain. Within an autonomous system or domain, the limited scope address range can be further subdivided so those local multicast boundaries can be defined. This also allows for address reuse among these smaller domains.

Note This address range is only for the group address or destination address of IP multicast traffic. The source address for multicast datagrams is always the unicast source address.

To configure the multicast gateway,

?? Select the “transparent” and then the “multicast” menus.

?? Enable the multicast gateway and set up the parameters as follows :

“RS232/485 input buffer size” parameter
Set up the maximum length of an asynchronous string the gateway will store before transmitting it to the IP network.

“Timeout of RS232/485 end of frame” parameter
Set up the delay the gateway will wait before declaring complete a string received from the asynchronous device.
Once declared complete, the gateway will transmit the string to the IP network.

“TCP port” parameter
Set the port number the gateway has to use.

Multicast group IP address
Enter the multicast IP address assigned to the group with respect to the rules of the IANA authority.

4.7.3 « Unitelway » menu

The unitelway gateway is made to connect an RS232-RS485 unitelway master PLC to an IP network.

?? Select the Unitelway menu; select "enable the unitelway transceiver".

?? Enter the XWAY address assigned to the asynchronous unitelway PLC on the IP network.

?? Select « enable the IP-RS transceiver ».

?? Enter the Xway address of the master PLC and, if they exist, the Xway addresses of the slave unitelway PLCs connected to the master PLC.

4.8 Diagnostic menu

?? **Logs :**
The log displays the last 300 dated events : ethernet & shdsl connections and disconnections, power on, RS232 gateway events.

?? **Network status :**
That page displays detailed information about each interface of the XSLAN (SHDSL 1 & 2, ethernet, RS232-RS485).

The SHDSL alinea shows the status of each shdsl interface :

Data rate
Connection status : Connected / connection in progress / disconnected)
Quality level of the connection from 1 to 5 : **The quality level has to be at least 3.**

The Show statistics button displays a page providing detailed technical information about each shdsl link quality.

?? **Microswitches status** :
That screen displays the status of the microswitches located on the top of the product.

?? **Ping :**
That screen enables to send a ping frame to an IP address.

IO control
That screen displays the status of the digital input and output and allows to set ON or OFF the alarm digital output.

4.9 Alarm menu

That page allow to configure SNMP traps, the alarm email and the event which causes the output to open (alarm status).

1 SHDSL link operation and troubleshooting

We summarize hereafter the different steps to carry-out to bring an shdsl link into service.

1.1 Configure the products

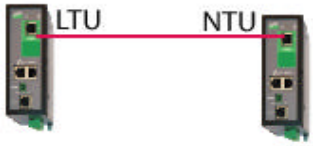
?? **Assign an IP address to each XSLAN switch**

See IP protocol & routing IP protocol menu
Configure the SHDSL interfaces of each XSLAN switch

?? **Configure the SHDSL port**
See “Ethernet & switching” / “SHDSL port” menu

Port 1: LTU or NTU

An LTU interface must be connected to an NTU interface.



Data rate = Select the auto option or a data rate in accordance with the distance (see appendix 1).

Note : If the “auto” option is selected, it will cause the XSLAN to try all the data rates. The connection delay will be longer. Moreover, the XSLAN software will select a cautious solution. It is why the “auto” option will be selected only if the distance is short (less than, 1 Km).

Don’t forget to SAVE each page and to REBOOT when the configuration is carried out (click the red button “Reboot”).

1.2 Connect the line

Wire 1 and 2 of each line can be inverted.

Check the cable shield is connected to the earth.

Note : For test purposes before installation a straight RJ45 cable can be used to simulate a line.

1.3 Check the transmission quality level

?? Check the lower led of each SHDSL interface blinks during the connection (about 50 seconds) and is then permanently lighted.

Note : the SHDSL led glitters slightly with the shds traffic.

?? Connect a PC to any of the switches to access to the html server of each of the shdsl switches.

Check the data rate and quality level of each link

If the quality level is 3 or more, the link is correct.
if the quality level is 1 or 2, decrease the data rate.

See the diagnostic menu

If necessary, press the “show statistics” button to display all the statistics of the link.

?? **Line or switch out of service**

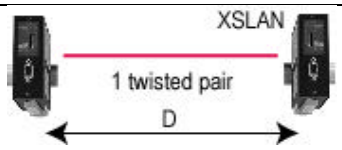
the SHDSL led turns OFF,
the Alarm output is open (depending on configuration);
an SNMP message is sent to the SNMP server (depending on configuration).

?? **When the link is set again**

the SHDSL led blinks and turns ON,
the Alarm output is closed (depending on configuration);
an SNMP message is sent to the SNMP server (depending on configuration).

Maximum distance between 2 switches versus data rate

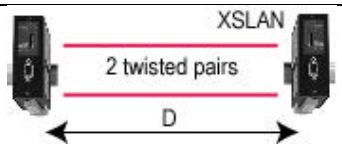
?? 1 twisted pair (2 wires)
?? Daisy chain or failsafe ring or point to point



Data rate?	128 Kb/s	1.15 Mb/s	2.3 Mb/s
? Wire F			
0.9 mm	13 Km (8 miles)	8 Km (5 miles)	6 Km (3.7 miles)
0.4 mm	7 Km (4.3 miles)	4 Km (2.5 miles)	3.5 Km (2.1 miles)

Maximum distance versus data rate

?? 2 twisted pair (4 wires)
?? Inverse-multiplexing



Data rate?	256 Kb/s	2.3 Mb/s	4.6 Mb/s
? Wire F			
0.9 mm	13 Km (8 miles)	8 Km (5 miles)	6 Km (3.7 miles)
0.4 mm	7 Km (4.3 miles)	4 Km (2.5 miles)	3.5 Km (2.1 miles)

Modifying an Ethernet connection so as to connect a PC directly to the Ethernet interface of the RAS.
Windows 2000 case

Not available yet

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